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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

COMPLETED ORIGINAL

Agencies Should Encourage Greater Computer Use On Federal Design Projects

SUMMARY

The use of computer-aided methods on Federal design projects is often limited or hampered by agency officials and agency procedures and practices. While significant benefits and savings are possible through computer aids, this capability is not always being used.

Changes in some procurement procedures should create an environment more conducive to greater, more efficient use of computer-aided methods. These changes should include (1) educating agency personnel about the capabilities and uses of computers in design, (2) requiring that computers be used for those analyses and design functions which can be done efficiently only with computers, (3) evaluating computer expertise when selecting architects and engineers for Federal projects, (4) discussing planned computer use during negotiations, and (5) revising fee proposal formats to recognize the role of computers in design and to clearly identify the services which will be provided under the contract.

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COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

AGENCIES SHOULD ENCOURAGE GREATER COMPUTER USE ON FEDERAL DESIGN PROJECTS

D I G E S T

Federal agencies are not actively seeking or encouraging the use of computers on Federal design projects. As a result, they are missing opportunities to achieve significant savings and improve the quality of Federal building designs.

Federal officials and agency procedures and practices often limit and/or hamper the use of computers on Federal projects. Agencies generally have not created an environment wherein the efficient use of computers is possible. Fee proposal forms used by most Federal agencies in acquiring architect-engineer services do not recognize the possible use of computers or provide a place for computer service costs to be included as direct costs in proposals. During contract negotiations, agency personnel rarely discuss the planned use of computers on a project. Even during the architect-engineer selection process, most agencies ignore computer capability.

BENEFITS OF COMPUTER AIDS IN DESIGN

In comparison to manual methods, computers can enable designers to produce higher quality, more effective facility planning and architectural designs; reduce the amount of energy consumed by buildings; and lower overall building costs through reduced construction, maintenance, and operating costs. In short, they enable the designer to consider more alternatives and do many things which are impossible using manual methods. (See ch. 2.)

GAO's survey of architectural and engineering firms indicates that the number of firms having computer capability or access to computer services is sufficient to provide adequate competition should agencies actively seek computer expertise for Federal projects. Details on the results of GAO's questionnaire survey are contained in a separate staff study (LCD-81-2).

COMPUTER USE NOT ENCOURAGED

Federal agencies have not created an environment which promotes or supports the efficient use of computer-aided design methods. Agency officials, sometimes unknowingly, limit computer use by (1) their general lack of understanding about computer-aided design methods and the related costs and (2) their restrictive procedures and actions in contract negotiations and project management. (See ch. 3.)

FEE PROPOSAL FORMATS IGNORE COMPUTER USE

All but one of the fee proposal formats Federal agencies use ignore computer-aided methods. Only a few formats clearly show the services to be provided. Also, formats lack uniformity, which creates confusion among architect-engineer firms doing work for more than one agency.

Revising the formats and redirecting the emphasis of the proposal from prescriptive ("who will do the work") to performance ("what work will be done") will insure all parties to the agreement clearly understand what work the fee will cover. It will also give negotiators the information they need to determine whether the proposed fee is fair and reasonable. Preprinted forms, which most agencies use, cause proposals to be tailored to the form instead of to the project. GAO believes revising the proposal formats and eliminating the existing preprinted forms to permit architect-engineer firms to submit fee proposals in a prescribed format, but

on the firms' own stationery, will provide a better tool for negotiating contracts. (See ch. 4.)

NEGOTIATIONS OVERLOOK COMPUTER USE

Federal agencies have generally ignored the evolution of the computer as a major design tool when negotiating architect-engineer services contracts. Negotiators do not necessarily insure that the architect-engineer firm has a clear understanding of the project requirements or that a fair and reasonable price is negotiated when computer-aided methods are used. (See ch. 5.)

COMPUTER EXPERTISE NOT A SELECTION FACTOR

Federal policy requires that architects and engineers be selected on the basis of their demonstrated competence and qualifications to do the work. Agencies are starting to require computer-based analyses, such as energy analyses. Still, few agencies consider and evaluate computer expertise when selecting an architect-engineer firm for a project. (See ch. 6.)

RECOMMENDATIONS

GAO recommends that the heads of departments and agencies procuring architect-engineer services take the following actions:

--Provide appropriate training on the capabilities and uses of computers in design to their employees. Also, encourage employees to stay current on new and improved uses of computers in their individual areas of expertise.

--Provide sufficient technical support to contract negotiating teams.

--Direct that computer use be required for those analyses and design functions which can be efficiently done only by computer-aided methods. Also, encourage computer use in all areas where the quality of the

design or the structure to be built can be improved when computer aids are used.

--Require computer capabilities and expertise to be considered and evaluated when selecting architects and engineers for projects on which computer-aided methods, such as in energy analyses, can be used. Also, revise the criteria used in evaluating overall qualifications of firms for design contracts to include computer capability and expertise.

--Require that architect-engineer contract negotiators routinely discuss and evaluate planned use of computers when negotiating design contracts.

GAO recommends that the Administrator, Office of Federal Procurement Policy, with the concurrence of the Director, Office of Management and Budget, promulgate an architect-engineer procurement policy which establishes that:

--Fee negotiations will be based on proposals which clearly identify tasks which will be performed by firms providing architect-engineer services, and, when applicable, indicate how computers will be used on the project.

--Procedures in pricing computer services will be flexible as long as the method used is the same as the firm uses for all its clients, both public and private, and conforms with existing Federal Procurement Regulations.

--A structured task-oriented fee proposal format will be developed and the use of preprinted fee proposal forms will be discontinued, permitting architect-engineers to submit their fee proposals in the prescribed structured format on their own stationery.

GAO also recommends that the Administrator require the Department of Defense and the General Services Administration to implement

the new policy by revising the Defense Acquisition Regulations and the Federal Procurement Regulations, respectively; and jointly ensuring that this policy is incorporated into the new Federal Acquisition Regulations currently being developed.

Further, GAO recommends that the Executive Secretary, Federal Construction Council, Building Research Advisory Board, direct the Council to develop educational programs and sponsor conferences aimed at educating Federal personnel about computer capabilities and uses in design. (See ch. 7.)

AGENCY COMMENTS

The 11 agencies commenting on the draft report generally agree, in principle, with the findings, conclusions, and recommendations presented in this report. However, some agencies disagree with three of the recommendations.

The General Services Administration and the U.S. Postal Service oppose requiring computer use for those analyses which can be efficiently done only by computer-aided methods. Both believe GAO is recommending wholesale use of computers without regard for the benefits which can reasonably be expected to be realized. Their interpretation is rather broad and inconsistent with the intent of the recommendation. Neither agency appears to be considering the full economic benefits offered by computers.

In addition, the General Services Administration opposes making computer capability and expertise a factor in selecting design firms. It believes this would discriminate against small firms because these firms do not have available the necessary computer capabilities. The results of the questionnaire survey show that computer capability is available to all firms regardless of size.

The U.S. Postal Service and the Veterans Administration oppose eliminating the preprinted fee proposal forms currently used by most agencies. Both agencies feel the form is essential for making it easier to compare the design firm's fee proposal and the Government's estimate and to facilitate the preaward audit, when required. GAO believes that the preprinted form is unnecessary and that a prescribed, structured fee proposal format will satisfy the U.S. Postal Service's and Veterans Administration's concerns. Several agencies already use the recommended procedures without any problems. (See ch. 8.)

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